

Rule
1.126

10/537180

IN THE CLAIMS:

Please amend claims 1, 5-6, 8 and 32, as shown below, in which deleted terms are shown with strikethrough or double brackets and added terms are shown with underscoring. Please add new claims 35-36, as shown below. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently amended) A method of manufacturing a hollow cylindrical body, comprising the steps of:

bending a plate material to have a substantially hollow cylindrical shape with end faces of the plate material opposing each other along a joining direction;

bringing the end faces of ~~[[a]]~~ the plate material, ~~the plate material having fingers projecting from corners along a joining direction,~~ into abutment against each other ~~to form protrusions projecting along the joining direction with end faces of the fingers, and also to form a hollow cylindrical body;~~

the plate material having fingers projecting from corners along the joining direction, and pairs of said fingers form protrusions projecting along the joining direction at opposite end of the hollow cylindrical shape;

gripping said protrusions by a gripping member mechanism such that the fingers of said protrusions are maintained in abutment along said joining direction;

while the protrusions are gripped in place, friction-stir-welding abutting regions of the end faces of the plate material to join the end faces to each other, thereby forming a hollow cylindrical body having said protrusions; and

removing said first and second protrusions;

wherein said end faces of the plate material are friction-stir-welded such that said abutting region is devoid of a formation of swellings.

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2. (Previously presented) A method of manufacturing a hollow cylindrical body according to claim 1, wherein said hollow cylindrical body having said protrusions is pressed from a side of an outer circumferential wall surface thereof when the abutting regions are friction-stir-welded.

3. (Previously presented) A method of manufacturing a hollow cylindrical body according to claim 1, wherein the abutting regions are friction-stir-welded while said hollow cylindrical body is inclined with respect to a horizontal direction.

4. (Previously presented) A method of manufacturing a hollow cylindrical body according to claim 1, wherein a wheel rim that is joined to a wheel disk to produce a vehicular wheel is manufactured as said hollow cylindrical body.

5. (Currently amended) A friction stir welding process for joining first and second ends of a metal workpiece together, comprising:

bringing a first end face and a second end face [[of a]] respectively on the first and second ends of the metal workpiece into abutment against each other~~[[,]]~~ ; and

thereafter joining said first end face and said second end face to each other along a boundary line where the end faces abut with a rotating friction stir welding tool having a probe with a substantially circular cross section on a tip end thereof,

wherein ~~when a first end having~~ said first end ~~[[face]]~~ is present on a retreating side relative to a rotating direction of said probe and ~~a second end having~~ said second end ~~[[face]]~~ is present on an advancing side relative to the rotating direction of said probe, a workpiece and said probe plunging member having a substantially circular cross section, which is disposed on a tip end of

~~said friction stir welding tool~~, is plunged with a central region thereof being displaced from [[a]] ~~said boundary line between said first end face and said second end face~~ to said second end by a predetermined distance within a range equal to or smaller than the radius of the ~~workpiece plunging member probe~~;

wherein a rotational axis of said probe extends substantially parallel to a plane between said first and second end faces where said faces are brought into abutment with each other; and

wherein a minimum value of displacement of said ~~workpiece plunging member probe~~ in said range is greater than 0.

6. (Currently amended) A friction stir welding process according to claim 5, wherein said ~~workpiece plunging member probe~~ is displaced from said boundary line to said second end by a distance equal to or smaller than one-half of the radius of the ~~workpiece plunging member probe~~.

7. (Original) A friction stir welding process according to claim 5, wherein a workpiece having said first end face and a workpiece having said second end face are separate from each other and are made of a chief component comprising the same metal.

8. (Currently amended) A friction stir welding process for joining first and second ends of a metal workpiece together, comprising:

bending the metal workpiece to have a curved shape;

bringing a first end face and a second end face [[of a]] respectively on the first and second ends of the metal workpiece having [[a]] the curved surface shape into abutment against each other to form abutting regions[[,]] ; and

then friction-stir-welding the abutting regions to join said end faces to each other using a

rotating friction stir welding tool having a probe on a tip end thereof, wherein

said first end face and said second end face have burrs projecting in a thickness direction of said metal workpiece, and sags ~~projecting~~ extending in a direction transverse to said thickness direction;

when said abutting regions are formed, said sags of said first end face and said second end face are disposed in confronting relation to each other and positioned ~~on a surface~~ outwardly of an outer circumferential ~~[[wall]]~~ surface of said curved ~~surface~~ shape, and said burrs are positioned ~~on a surface~~ inwardly of an inner circumferential ~~[[wall]]~~ surface of said curved ~~surface~~ shape; wherein said outer circumferential ~~[[wall]]~~ surface is longer than the inner circumferential ~~[[wall]]~~ surface; and

when the abutting regions are friction-stir-welded, ~~[[a]] said probe plunging member of a friction stir welding tool~~ is plunged into the outer circumferential ~~[[wall]]~~ surface on which said sags are disposed in confronting relation to each other ~~[[,]]~~ and thereafter ~~said friction stir welding tool~~ is moved in a joining direction along the abutment between the end faces to scan said abutting regions.

9. (Previously presented) A friction stir welding process according to claim 8, wherein said first end face and said second end face are present on the same metal workpiece, and said abutting regions are provided by curving said metal workpiece to bring said first end face and said second end face into abutment against each other.

¹⁰
~~32.~~ (Currently amended) A method of manufacturing a hollow cylindrical body according to claim 1, wherein:

the step of said friction-stir-welding involves use of a friction stir welding tool having a

probe on a tip end thereof; comprises a method step of plunging said probe is plunged into
portions of the plate material around said end faces thereof and moved in the joining direction
along the abutment between the end faces therebetween with a workpiece plunging member; said
probe having a substantially circular cross section; and wherein

said ~~workpiece plunging member~~ probe is displaced from a boundary line between said
 end faces ~~to one of ends of said plate material within a range less than or equal to a radius of the~~
~~workpiece plunging member; wherein a minimum value of displacement of said workpiece~~
~~plunging member in said range is greater than 0~~ in a circumferential direction of said hollow
cylindrical body by a predetermined distance.

¹¹
~~33.~~ (Previously presented) A friction stir welding process according to claim 5, wherein each
 of said first and second end faces of the metal workpiece comprise a finger, which forms
 protrusions along a joining direction of said first and second end faces when said first and second
 end faces are brought into said abutment.

¹²
~~34.~~ (Previously presented) A friction stir welding process for bringing a first end face and a
 second end face of a metal workpiece according to claim 8, wherein each of said first and second
 end faces of the metal workpiece comprise a finger, which forms protrusions along a joining
 direction of said first and second end faces when said first and second end faces are brought into
 said abutment.

¹³
~~35.~~ (New) A method of manufacturing a hollow cylindrical body according to claim 1,
 wherein the step of said gripping said protrusions includes only gripping said protrusions by said
 gripping mechanism.

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36. (New) A friction stir welding process according to claim 8, wherein said metal workpiece comprises fingers extending from corner portions thereof; and wherein said bending said metal workpiece abuts respective said fingers thereby forming protrusions at opposite ends of the abutting regions;

wherein said friction stir welding process further comprises gripping said protrusions by a gripping mechanism such that the fingers of said protrusions are maintained in abutment along said joining direction.